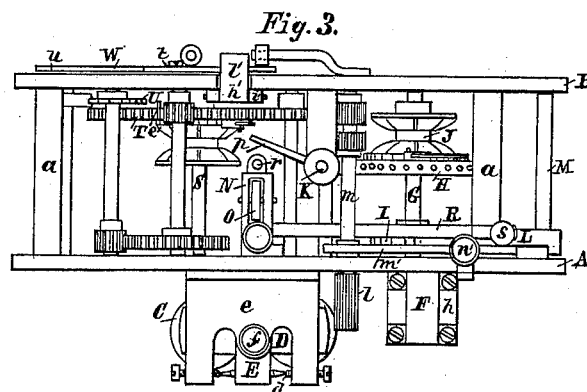
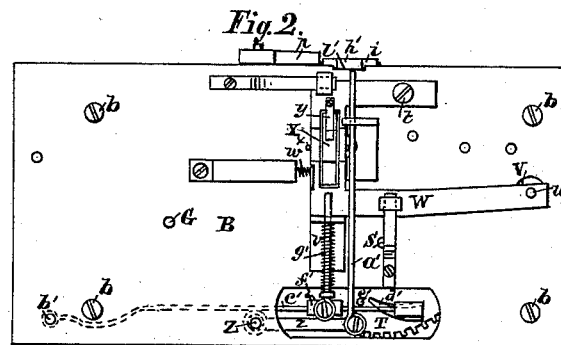
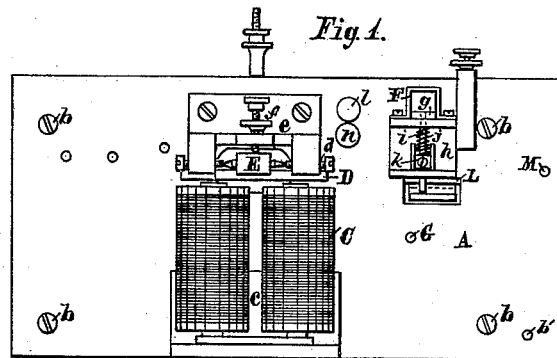


A. C. PALMER.

ELECTRIC PUNCH REGISTER.

No. 383,485.

Patented May 29, 1888.



Attest;

Edward Wyman,
Chas. H. Richardson.

Inventor;

Augustus C. Palmer,
per Edward Summer, atty.

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Fig. 4.

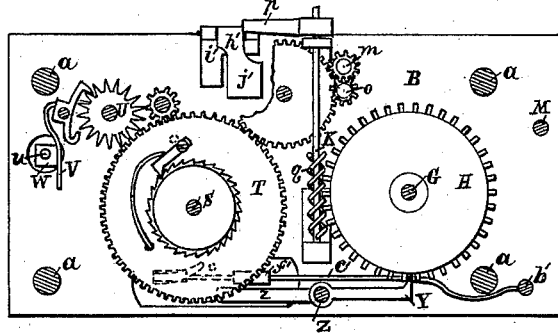


Fig. 5.

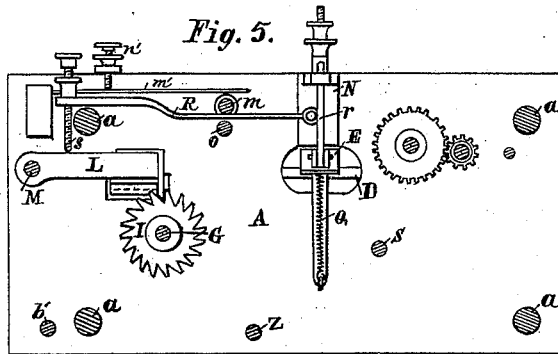


Fig. 6.

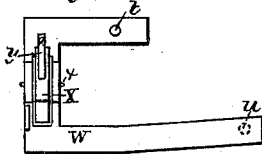


Fig. 7.

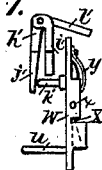


Fig. 8.



Fig. 9.

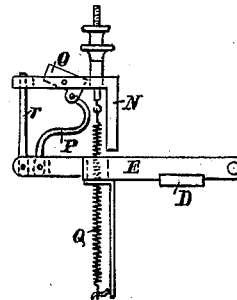
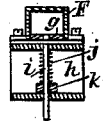


Fig. 10.



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UNITED STATES PATENT OFFICE.

AUGUSTUS C. PALMER, OF UTICA, NEW YORK.

ELECTRIC PUNCH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 383,485, dated May 29, 1888.

Application filed November 20, 1886. Serial No. 219,533. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS C. PALMER, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Electric Punch-Registers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to electric registering-machines by which holes are punched in a strip of paper for fire-alarm, police, or other purposes; and it consists in the devices and their combinations hereinafter described, and specifically pointed out in the claims.

In the drawings—two sheets—Figure 1 is a front view of an electric punch-register embodying my invention. Fig. 2 is a rear view, and Fig. 3 a plan, of the same. Fig. 4 is a vertical longitudinal section about midway between the front and rear plates, and shows the parts held in place within the machine on the inner face of the rear plate. Fig. 5 is a similar section, but showing the parts located within the machine on the inner face of the front plate. Fig. 6 shows the pivoted plate W and latch X pivoted therein. Fig. 7 shows a side view of the same, and also the lever *h'* and the stand to which it is hinged. Fig. 8 shows the latch X. Fig. 9 is a side view of the parts immediately connected with the armature and armature-lever. Fig. 10 is a vertical transverse section of the die and box thereon.

The frame of the machine is composed of the front plate, A, rear plate, B, and four rods, *a*, at right angles to the plates and fastened to the plates by screws *b*.

The electro-magnet C is supported by a stand, *c*, on the outer face of the front plate, A. Its armature D is fixed on a lever, E, which is pivoted at *d* to a stand, *e*, fastened on said outer face. The lever E extends through an opening in the plate A into the space between the plates A and B. A thumb-screw and nut, *f*, provide means for gaging the distance of motion of the armature and armature-lever.

The die *g* is fastened on a support, *h*, which also guides the vertical punch-rod *i*. A spiral spring, *j*, on the punch-rod, between the upper part of the support *h* and a collar, *k*, on

the punch-rod, presses the punch out of the die. Said collar, by coming against the lower part of the support *h*, gages the downward motion of the punch-rod. Above the die is a box, F, which is closed at all sides except at the front.

There are two feed-rollers, between which the strip of paper which is punched passes—one, *l*, fastened on a shaft, *m*, and the other, *n*, fastened on a shaft, *o*. These shafts extend inward through the front plate, A, and are geared together as shown, the bearings for the shafts being supported by the front and rear plates, A and B. Provision is made for a slight swinging motion vertically of the outer end of the shaft *m*, and hence a vertical movement of the upper feed-roller, *l*.

A shaft, G, having bearings at the ends in the plates A and B, has fixed thereon two wheels, which I call "key-wheels." One, H, has teeth of the form of round pins, and the other, I, ratchet-teeth. On this shaft is also a drum, J, preferably suitable to be revolved by means of the well-known device of an endless chain and a weight. This drum is connected with the key-wheel H by the ordinary ratchet-wheel, pawl, and spring, so that the falling of the weight will cause the shaft G and key-wheels to revolve, while the weight may be raised without revolution of said shaft and key-wheels.

A vertical shaft, K, having bearings in stands fixed on the inner face of the rear plate, B, has at the upper end a horizontal arm, *p*, and about midway its length a worm, *q*, preferably of two parallel threads. The shaft K is so located with reference to the key-wheel H and the worm thereon is such that the shaft K may be revolved by means of the wheel H. The key-wheel H has twice as many teeth as the key-wheel I.

A "key," L, which is an arm formed at the outer end to be swung by each tooth on the key-wheel I, is fastened at the inner end to a shaft, M, having bearings at the ends in the plates A and B. This key L has an arm which extends through an opening in the plate A and under the punch-rod *i*, as shown.

In a mortise in the horizontal part of a stand, N, fastened on the inner face of the plate A, is pivoted at or near its center a latch, O. In said horizontal part, near the end thereof, is also an

opening, in which may slide a vertical rod, *r*, which is pivoted at the lower end to the armature-lever near its inner end. A rod, *P*, bent somewhat in the shape of the letter *S*, connects the armature-lever with the latch *O*, being pivoted to each. A spiral spring, *Q*, fastened at the lower end to an arm extending downward from the armature-lever and connected at the upper end to the stand *N* by means of an adjusting screw and a nut, acts to raise the armature-lever, and hence to withdraw the armature from the magnet. A lever, *R*, is pivoted at the inner end to the stand *N* and extends under and in close proximity to the upper feed-roller shaft, *m*. The outer end of this lever *R* is supported by the key *L* by means of a screw, *s*, adjustable in the end of the lever *R*.

On a shaft, *S*, having bearings at the ends in the plates *A* and *B*, is a drum similar to the drum *J* and connected with a gear, *T*, as the drum *J* is connected with the key-wheel *H*. The gear *T* drives the feed-rollers by means of a pinion on the upper roller-shaft, *m*, and an intermediate gear on another shaft, as shown. The gear *T* also causes rotation of a verge-wheel, *U*, by means of the intermediate pinions, gears, and shafts shown. A verge is pivoted in suitable relation to the verge-wheel to engage therewith, as in ordinary clock-work, by means of a shaft having bearings in the plates *A* and *B*. An arm, *V*, extends downward from the verge.

On the outer face of the plate *B* is a plate, *W*, which may swing in the direction of the plane thereof, being pivoted at *t*, and being kept closely against the plate *B* by the friction-rolls shown. It has at the outer end of one of its arm portions a pin, *u*, which extends inward through an opening in the plate *B*. When the plate *W* is swung down to its lowest position, in which it is shown in the drawings, it rests on a stand, *v*, and it is pressed to that position by a spiral spring, *w*, acting against a lip on the plate *W*. When this plate is thus down, the pin *u* is out of engagement with the verge-arm *V*; but when it is swung up the pin *u* engages with this verge-arm to prevent its swinging motion and the rocking movement of the verge.

In a mortise in the plate *W* is pivoted at *x* a latch, *X*, at about midway its length, to swing in a plane at right angles to the plate. A spring, *y*, pressing against the upper part of the latch *X*, acts to swing the lower end of the latch out beyond the surface of the plate *W*.

A key, *Y*, which is an arm fastened at one end to a shaft, *Z*, is formed at the outer end to engage with the teeth on the key-wheel *H*. Near the inner face of the plate *B* is another arm, *z*, on the shaft *Z*, which, being bent at right angles at the outer end, extends through an opening in the plate *B* and has pivoted thereto the lower end of a vertical rod, *a'*. This rod is guided at the upper part in an opening in a stand, as shown. Pivoted by means of another shaft, *b'*, having bearings in

the plates *A* and *B*, is a long arm, *c'*, which carries at the outer end a cam-piece, *d'*. Each of two pins, *e'*, on the side of the gear *T* may engage with the cam-piece *d'* in such a manner as to swing the arm *c'* upward. On this arm *c'* is also fixed a block, *f'*, which extends through an opening in the plate *B*, and to which is pivoted a vertical rod, *g'*, which, being guided by an opening in the stand *v*, may press against the lower end of the latch *X* when the latter is swung outward.

Near the upper edge of the plate *B* is hinged a lever, *h'*, to a stand, *i'*, fixed on the inner face of the plate *B*. This lever has two leaf-like portions at about right angles to each other, one, *j'*, nearly vertical, extending down by the inner side of the plate *B*, and which may press against a pin, *k'*, extending inward through an opening in the plate *B* from the upper part of the latch *X*. The other leaf or arm, *l'*, projects outward over the upper end of the vertical rod *a'*.

While the circuit is closed the mechanism is at rest. The armature-lever is down, holding the rod *r* down out of the range of the arm *p*, and the latch *O* in position, so that the arm *p* bears against the end projecting above the stand *N*. The punch *i* is down out of the die *g*. The upper feed-roller is pressed down onto the lower one by means of a spring, *m'*, which bears on the shaft of the upper feed-roller, the tension of which is gaged by the screw and nut at *n'*. One of the pins *e'* on the gear *T* holds the arm *c'* up by means of the cam-piece *d'*, so that the arm *c'* holds the plate *W* in its position when swung up by means of the rod *g'*, which presses against the projecting end of the latch *X*. Thus the pin *u*, engaging with the verge-arm, prevents the rotation of the gearing and the feed-rollers driven thereby. Each of the keys bears against its key-wheel between the teeth thereof. When the circuit is broken the armature is released and the armature-lever is swung up by the spring *Q*. The latch *O* is swung out of engagement with the arm *p*. The shaft *K* now makes one revolution, the arm *p* being first caught by the projecting rod *r* and then by the projecting latch *O*, the rod *r* being raised on breaking the circuit, but lowered on closing the same and when the latch is raised. A revolution of the shaft *K* allows the key-wheel *H* to move the distance of two teeth, and hence the key-wheel *I* on the same shaft one tooth. By means of the key-wheel *H*, key *Y*, arm *z*, rod *a'*, and lever *h'* the lower end of the latch *X* is swung inward away from engagement with the vertical rod *g'*, thus allowing the cam-piece *d'* to be swung out of the way of the pin *e'* on the gear *T*, and also the plate *W* to drop, so as to swing the pin *u* out of engagement with the verge-arm *V*. The gear *T* may then revolve, causing revolution of the feed-rollers *l n*. There being two movements of the key *Y*, caused by two teeth of the wheel *H* during one revolution of the shaft *K*, the revolution of gear *T*, and hence of the feed-

rollers, is stopped twice—once at about the middle of the revolution of the shaft K and again at the end thereof. During this action of and by the key Y, the key L is swung by a tooth on its key-wheel, and raises the upper feed-roller from the lower one by means of the lever R, which is thus carried upward when in contact with this roller-shaft. When the upper feed-roller is raised, there will be no movement of the paper. It may be, by suitable adjustment, either when the upper feed-roller is raised or when the feed-rollers are stopped, as set forth above, that the key L pushes the punch-rod upward and causes the punch to pass through the paper and enter the die, and that the punch is withdrawn and the key L returned to its former position by means of the spring j.

The box F, being closed at all sides but the front, as described above, prevents the pieces of paper punched out from passing onto the paper, and provides for the ready removal of these pieces.

I claim as my invention—

1. In an electric punch-register, the combination, with two feed-rollers, the shaft of one of which may be swung as specified, of a toothed or key wheel, I, a lever or key, L, a lever, R, provided with an adjusting-screw, s, to bear on the lever or key L, a spring, m', and screw n', for gaging the tension of said spring, said key-wheel, levers, and spring being for swinging said shaft, substantially as shown and described.
2. In an electric punch-register, in combination with a punch and die and two feed-rollers, the shaft of one of which may swing, a toothed or key wheel, I, a lever or key, L, operated by said key-wheel and provided with an arm extending under the punch to operate the same, and a lever, R, for swinging said shaft, and provided with an adjusting-screw, s, to

bear on the lever or key L, substantially as shown and described.

3. The combination, with an armature, of an armature-lever, a sliding rod, r, latch O, a shaft, K, bearing an arm, p, and mechanism for revolving said shaft, substantially as and for the purposes set forth.

4. The combination of the toothed or key wheel H, the lever or key Y, arm z, rod a', lever h', and latch X, which is an element in the stopping mechanism, substantially as and for the purpose set forth.

5. A gear, T, provided with one or more pins, e', a shaft, b', arm c', provided with a cam-piece, d', a rod, g', a pivoted plate, W, and a latch, X, pivoted in said plate, substantially as described.

6. The combination of a lever or key, Y, operated as set forth, a rod, a', a lever, h', a pivoted plate, W, bearing a pin, u, a latch, X, a rod, g', an arm, c', bearing a cam-piece, d', a gear, T, provided with one or more pins, e', a verge-wheel driven by said gear, and a verge, substantially as described.

7. In an electric punch-register, and in combination with the punch and die and mechanism, including a key-wheel, I, and key L, for operating the punch, feed-rollers revolved independently of said mechanism by means of clock-work regulated by a verge and verge-wheel, and stopped by a pin or like instrument engaging with an arm extending from said verge, said pin being moved into the path of said arm by devices controlled by means of a key, Y, and a key-wheel, H, fixed on the same shaft with the key-wheel I, substantially as described.

AUGUSTUS C. PALMER.

Witnesses:

LEWIS E. GOODIER,
DAVID C. WOLCOTT.